

WHAT IS CLAIMED IS:

1. An image processing apparatus for generating scaled image data that is obtained by scaling the image data according to a specified scaling factor, the image processing apparatus
5 comprising:

a receiver that receives an input of pixel value information of each pixel which is contained in image data to be processed in raster scan order;

a first memory that stores the pixel value information
10 input in the raster scan order, the first memory having a capacity equal to or less than a main scanning direction width of the image data;

a second memory that is capable of retaining the scaled image data as much as the main scanning direction width relative
15 to a main scanning direction and at least a part of the scaled image data relative to a subscanning direction;

a destination address generator that generates destination address information in the second memory to specify a destination location of the pixel value information stored
20 in the first memory in response to the specified scaling factor; and

a transferring unit that transfers the pixel value information from the first memory to the second memory based on the generated destination address information.

2. An image processing apparatus for generating scaled image data that is obtained by scaling the image data according to a specified scaling factor, the image processing apparatus comprising:

5 a receiver that receives an input of pixel value information of each pixel which is contained in image data to be processed in raster scan order;

 a first memory that stores the pixel value information input in the raster scan order, the first memory having a capacity
10 equal to or less than a main scanning direction width of the image data;

 a second memory that is capable of retaining the scaled image data as much as the main scanning direction width relative to a main scanning direction and at least a part of the scaled
15 image data relative to a subscanning direction;

 a source address generating unit that generates a source address information in the first memory that stores the pixel value information to be retained in each address in the second memory based on an address shift amount determined in response
20 to the specified scaling factor; and

 a transferring unit that transfers the pixel value information from the first memory to the second memory based on the generated source address information.

25 3. The image processing apparatus as claimed in claim 1 further

comprising:

a dividing unit that divides the image data into pixel blocks of a size defined based on the capacity of the first memory, wherein

5 the first memory stores the pixel value information contained in the divided pixel block.

4. The image processing apparatus as claimed in claim 2 further comprising:

10 a dividing unit that divides the image data into pixel blocks of a size defined based on the capacity of the first memory, wherein

the first memory stores the pixel value information contained in the divided pixel block.

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5. The image processing apparatus as claimed in claim 2, wherein the source address generating unit generates the source address using an offset value;

the offset value is provided based on a cumulative addition calculation of the address shift amount; and

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the source address generating unit includes:

a retaining unit that retains at least a decimal place of the offset value at a point after the pixel value information is transferred.

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6. The image processing apparatus as claimed in claim 2,

wherein the source address generating unit generates the source addresses using respective offset values relative to the main scanning direction and the subscanning direction;

5 the respective offset values are provided by performing a cumulative addition calculation of the address shift amounts responsive to the scaling factor in the main scanning direction and that in the subscanning direction; and

the source address generating unit includes:

10 a first retaining unit that retains at least a decimal place of the offset value relative to the main scanning direction at a point after the pixel value information is transferred; and

15 a second retaining unit that retains at least a decimal place of the offset value relative to the subscanning direction.

7. The image processing apparatus as claimed in claim 5,

wherein the source address generating unit further includes:

20 an initial value retaining unit that retains at least the decimal place of the offset value at the point when the pixel value information has been transferred as much as a capacity of the second memory as an initial value of a next source address calculation, if the second memory cannot retain
25 the pixel value information as much as the subscanning direction

width of the scaled image data.

8. The image processing apparatus as claimed in claim 5,
wherein the address shift amount is a reciprocal of the
5 specified scaling factor; and

the source address generating unit updates the offset
value by adding the address shift amount to the current offset
value, and increments the source address by one if the updated
offset value becomes one or more.

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9. The image processing apparatus as claimed in claim 6,
wherein the address shift amount is a reciprocal of the
specified scaling factor; and

the source address generating unit updates the offset
15 value by adding the address shift amount to the current offset
value, and increments the source address by one if the updated
offset value becomes one or more.

10. The image processing apparatus as claimed in claim 7,

20 wherein the address shift amount is a reciprocal of the
specified scaling factor; and

the source address generating unit updates the offset
value by adding the address shift amount to the current offset
value, and increments the source address by one if the updated
25 offset value becomes one or more.

11. The image processing apparatus as claimed in claim 7,
wherein the address shift amount is a reciprocal of the
specified scaling factor; and

5 the source address generating unit updates the offset
value by adding the address shift amount to the current offset
value, increments the source address by one if the updated offset
value becomes one or more, refers to a location of the pixel
value information stored in the first memory on the image data
10 to be processed, and sets the offset value to the initial value
retained in the initial value retaining unit if the location
satisfies a predetermined condition.

12. An image processing method for generating scaled image data
15 that is obtained by scaling the image data according to a
specified scaling factor, the image processing method
comprising:

receiving an input of pixel value information of each
pixel which is contained in image data to be processed in raster
20 scan order;

storing the pixel value information input in the raster
scan order in a first memory which has a capacity equal to or
less than a main scanning direction width of the image data;
generating destination address information in the second
25 memory to specify a destination location of the pixel value

information stored in the first memory in response to the specified scaling factor, wherein the second memory is capable of retaining the scaled image data as much as the main scanning direction width relative to a main scanning direction and at least a part of the scaled image data relative to a subscanning direction; and

transferring the pixel value information from the first memory to a second memory based on the generated destination address information.

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13. An image processing method for generating scaled image data that is obtained by scaling the image data according to a specified scaling factor, the image processing method comprising:

15 receiving an input of pixel value information of each pixel which is contained in image data to be processed in raster scan order;

storing the pixel value information input in the raster scan order in a first memory which has a capacity equal to or less than the main scanning direction width of the image data;

20 generating a source address information in the first memory that stores the pixel value information to be retained in each address in the second memory, that is capable of retaining the scaled image data as much as the main scanning direction width relative to a main scanning direction and at least a part

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of the scaled image data relative to a subscanning direction,
based on an address shift amount determined in response to the
specified scaling factor; and

transferring the pixel value information from the first
5 memory to a second memory based on the generated source address
information.

14. An image processing program for realizing a processing to
a computer to generate scaled image data that is obtained by
10 scaling the image data according to a specified scaling factor,
the image processing method comprising:

receiving an input of pixel value information of each
pixel which is contained in image data to be processed in raster
scan order;

15 storing the pixel value information input in the raster
scan order in a first memory which has a capacity equal to or
less than a main scanning direction width of the image data;

generating destination address information in the second
memory to specify a destination location of the pixel value
20 information stored in the first memory in response to the
specified scaling factor, wherein the second memory is capable
of retaining the scaled image data as much as the main scanning
direction width relative to a main scanning direction and at
least a part of the scaled image data relative to a subscanning
25 direction; and

transferring the pixel value information from the first memory to a second memory based on the generated destination address information.

- 5 15. An image processing program for realizing a processing to a computer to generate scaled image data that is obtained by scaling the image data according to a specified scaling factor, the image processing program comprising:

receiving an input of pixel value information of each
10 pixel which is contained in image data to be processed in raster scan order;

storing the pixel value information input in the raster scan order in a first memory which has a capacity equal to or less than the main scanning direction width of the image data;

- 15 generating a source address information in the first memory that stores the pixel value information to be retained in each address in the second memory, that is capable of retaining the scaled image data as much as the main scanning direction width relative to a main scanning direction and at least a part
20 of the scaled image data relative to a subscanning direction, based on an address shift amount determined in response to the specified scaling factor; and

transferring the pixel value information from the first memory to a second memory based on the generated source address
25 information.